Comprehensively Deepen EU-China Industrial Cooperation

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Abstract: As China and the European Union have continuously deepened economic and trade cooperation, their industrial cooperation has marched to a comprehensive new stage. Especially when China's economy has entered the new normal, the transformation of industrial structure and consumption upgrading and the explosive increasing demand for high-end products and service provide new development space for industrial cooperation of the two sides. By analyzing the current new trends and characters appeared in EU-China industrial cooperation, and appropriately handling differences and problems, it will be helpful to promote the complementary advantages, cooperation and interaction and mutual benefit of EU-China industry.

Currently, together, China and the EU member states account for 37% of the global economy. The economic and trade cooperation between China and the EU has increased steadily over the years, which has laid a solid foundation for enhancing EU-China industrial cooperation.

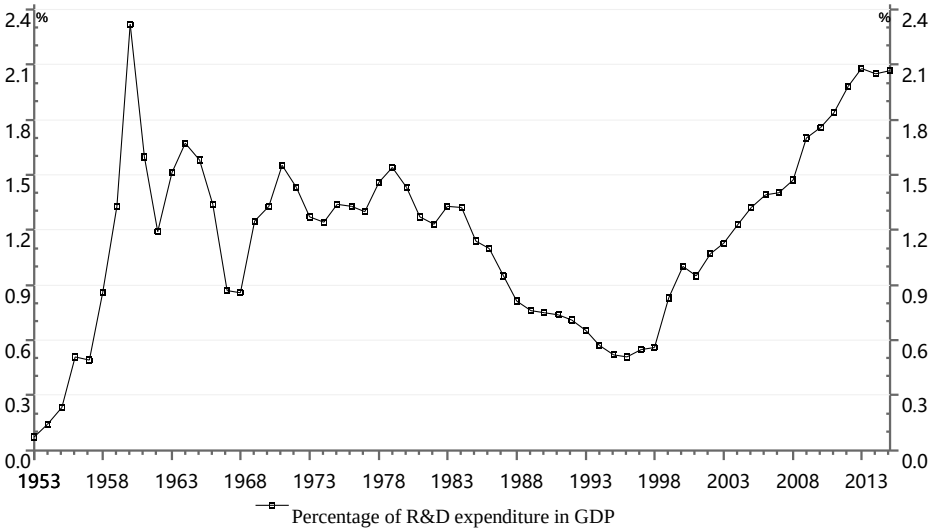
1. The Current Situation of EU-China Industrial Cooperation

1.1 China's demand upgrading leads EU-China industrial cooperation into a new stage

Since the reform and opening-up, China has experienced a period of economic shortage. Before 2000, it was the most important thing to keep consumers well fed and clothed, which led to the rapid development of China's textile industry. After 2000, China bid farewell to the economy of shortage. Consumers' demand for vehicles, houses, cellphones and other telecommunication products increased rapidly, and this led to the development of heavy and chemical industry such as steel, cement, glass, construction materials, and the rapid development of power generation equipment, engineering equipment and other manufacturing industries. During this time an extensive development mode of high growth, high emission and high energy consumption was formed to some extent. After 2012, China's economic development has entered a new stage. On the one hand, low-end products are overproduced, and enterprises suffer product backlog; on the other hand, high-quality and high-tech products cannot meet consumers' upgraded demand. Especially the wealthy 80s and 90s generation, they are no longer sensitive to price as their parents, and they are sensitive to value and become the main force of demand for high-end products and service. As economists predict, the affluent Chinese middle-class may double in the next five years.

Under the guidance of new need, in Chinese market, the demand for green product, high-quality products and service, multiple technology and performance from countries including the EU is increasing in exponential terms. In recent years, the popularity of oversea online shopping and purchasing is increasing, and the domestic tourists' "crazy shopping" in Europe, Japan, Korea and Hong Kong proves that Chinese affluent consumers' demand for quality and service drives the swift growth of demand for oversea shopping, cross-border e-commerce and imported products. Thus, the power for the transformation and upgrading of China's supply side comes from changes of new demand, especially since 2012, China's economic and industrial development has formed a new trend.

Firstly, the attention for the technology innovation increases continuously. In recent years, China's total research and development expenditure has continuously increased and successively exceeded Britain, France, Germany and Japan, ranking second only to America in science and technology investment. In 2015, the national total R&D expenditure reached 1416.99 billion RMB, which increased 8.9%; and the percent of R&D expenditure in GDP increased annually (figure 1). R&D investment intensity (the ratio to GDP) was 2.07% in 2015, which was still not enough by comparing with 3%-4% level of the developed countries.



Data source: Wind

Figure 1 intensity of R&D expenditure

In terms of research and development innovation activities, expenditure proportions of basic research, application research and experimental development are 5.1%、10.8% and 84.1% respectively. In terms of activity entities, expenditure proportions of enterprise, government-owned research institute and university are 76.8%、15.1% and 7.0% respectively. In terms of industrial sectors, there are seven industries with R&D expenditure over 50 billion RMB and the spending of these 7 industries takes 60.8% of

total R&D expenditure of all the above-scale industrial enterprises (table 1)[1].

Table 1 R&D Expenditure of Industrial Enterprises Above Designated Size in 2015

Industry	R&D expenditure (hundred million)	Intensity of R&D expenditure (%)	Industry	R&D expenditure (hundred million)	Intensity of R&D expenditure (%)
Total	**10013.9**	**0.90**	Manufacture of Raw Chemical Materials and Chemical Products manufacturing	794.5	0.95
Mining industry	269.6	0.52	Manufacture of Medicines	441.5	1.72
Coal mining and washing industry	143.3	0.60	Manufacture of Chemical Fibers	78.5	1.09
Extraction of Petroleum and Natural Gas	62.5	0.79	Manufacture of Rubber and Plastic Products	242.6	0.78
Mining and Processing of Ferrous Metal Ores	9.2	0.13	Manufacture of Non-metallic Mineral Products	277.6	0.47
Mining and Processing of Non-Ferrous Metal Ores	22.0	0.35	Smelting and Pressing of Ferrous Metals	561.2	0.89
Mining and Processing of Non-metal Ores	10.4	0.19	Smelting and Pressing of Nonferrous metals	371.5	0.72
Support Activities for Mining	22.2	1.28	Manufacture of Metal Products	282.7	0.75
Manufacturing	9650.0	0.97	Manufacture of General Purpose Machinery	632.6	1.35
Processing of Food from Agricultural products	216.0	0.33	Manufacture of Special Purpose Machinery	567.1	1.58
Manufacture of Foods	135.4	0.62	Manufacture of Automobiles	904.2	1.27
Manufacture of Liquor, Beverage and Refined Tea industry	90.0	0.52	Manufacture of Railway, Ship Aerospace and Other Transport Equipment	435.9	2.30
Manufacture of Tobacco	20.8	0.22	Manufacture of Electrical Machinery and Apparatus and equipment manufacturing industry	1012.7	1.46
Manufacture of Textile	207.7	0.52	Manufacture of Computers, Communication and Other Electronic Equipment	1611.7	1.76

[1] National Bureau of Statistics, Ministry of Science and Technology, Ministry of Finance: Statistical Bulletin of National Science and Technology Investment in 2015.

Manufacture of Textile, Wearing Apparel and Accessories	90.1	0.41	Manufacture of Measuring Instruments and Machinery	180.9	2.08
Manufacture of Leather, Fur, Feather and Related Products and Footwear	51.1	0.35	Other manufacture	27.3	0.90
Processing of Timber , Manufacture of Wood, Bamboo, Rattan, Palm and Straw Products	42.8	0.31	Utilization of Waste Resources	9.8	0.26
Manufacture of Furniture	33.0	0.42	Repair Service of Metal Products, Machinery and Equipment	11.7	1.20
Manufacture of Paper and Paper products	107.6	0.77	Production and Supply of Electricity, Heat, Gas and Water	94.3	0.15
Printing and Reproduction of Recording media	36.9	0.50	Production and Supply of Electric Power and Heat Power	81.4	0.14
Manufacture of Articles for Culture Education, Arts and Crafts, Sports and Entertainment Activities	73.7	0.46	Production and Supply of Gas	6.4	0.10
Processing of Petroleum, Coking and Processing of Nuclear Fuel industry	100.8	0.29	Production and Supply of Water	6.5	0.34

In terms of regions, the intensities of R&D expenditure in these eight provinces, Beijing, Shanghai, Tianjin, Jiangsu, Guangdong, Zhejiang, Shandong and Shanxi, are higher than 2.07%, the national average level (table 2).

Table 2 R&D Expenditure of Different Regions in 2015

Region	R&D expenditure (hundred million)	Intensity of R&D expenditure (%)
The whole country	14169.9	2.07
Beijing	1384.0	6.01
Tianjin	510.2	3.08
Hebei	350.9	1.18
Shanxi	132.5	1.04
Inner Mongolia	136.1	0.76
Liaoning	363.4	1.27
Jilin	141.4	1.01

Heilongjiang	157.7	1.05
Shanghai	936.1	3.73
Jiangsu	1801.2	2.57
Zhejiang	1011.2	2.36
Anhui	431.8	1.96
Fujian	392.9	1.51
Jiangxi	173.2	1.04
Shandong	1427.2	2.27
Henan	435.0	1.18
Hubei	561.7	1.90
Hunan	412.7	1.43
Guangdong	1798.2	2.47
Guangxi	105.9	0.63
Hainan	17.0	0.46
Chongqing	247.0	1.57
Sichuan	502.9	1.67
Guizhou	62.3	0.59
Yunnan	109.4	0.80
Tibet	3.1	0.30
Shaanxi	393.2	2.18
Gansu	82.7	1.22
Qinghai	11.6	0.48
Ningxia	25.5	0.88
Xinjiang	52.0	0.56

Therefore, whether from the ratio of R&D expenditure in GDP or from the regional, industrial and sectorial terms, investment in China-made technology is improving rapidly. We can also notice this trend from transactions in technology market (figure 2). With the acceleration of China's industrial transformation and upgrading, there is broad cooperation space for EU-China in high-tech areas.

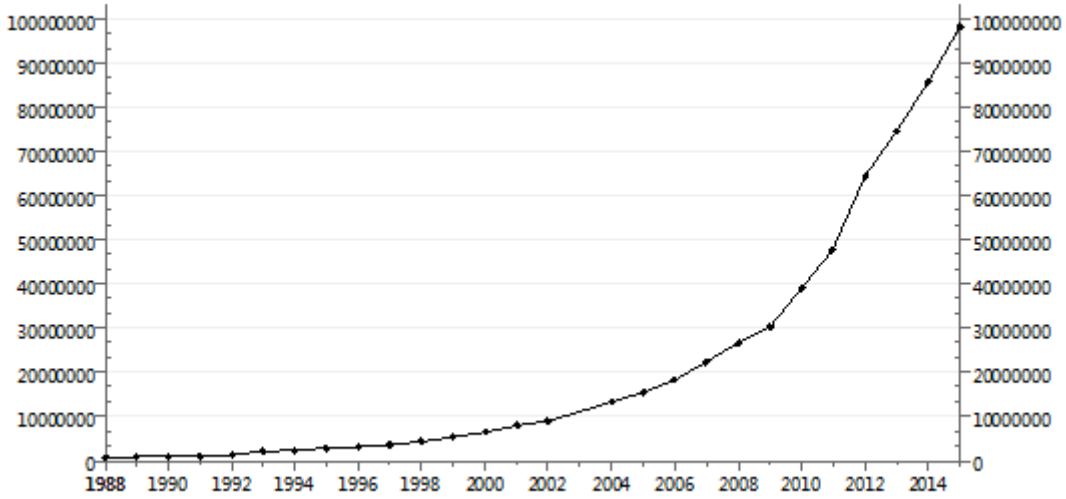
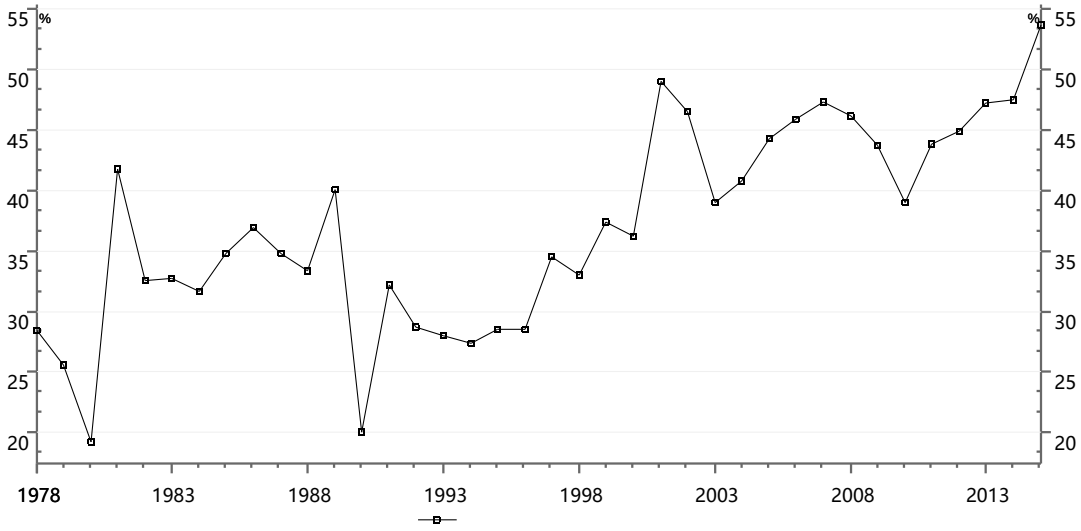


Figure 2 Volume of business in technology market during 1988 -2015 (ten thousand RMB)

Secondly, service economy develops rapidly driven by the need of manufacturing transformation and upgrading. The value-added by China's service industry in GDP exceeded 50%[2] for the first time in 2015, which shows that China has marched to a transforming period from industrial economy to service economy.



Data source: Wind

Figure 3 Contribution rate of the tertiary industry to GDP growth

The prediction shows that during 2016-2020, the marketization reform of service economy will be the key point. Service industries such as education, medical treatment, healthcare and elderly care service will develop rapidly, and market environment of

[2] China modernization research center of China Academy of Science: <China modernization report 2016: modernization research of service industry>

productive service industries such as researching, logistics, marketing, and information will be gradually optimized. For the next five years, China's service trade is predicted to keep an increasing rate of over 10%. The proportion of trade in service will increase to 20% in 2020 from 12.3% in 2014. This will not only decisively influence China's economic transformation and upgrading, but also bring great opportunity for deepening EU-China cooperation.

Thirdly, the power mechanism of China's economic growth is undergoing historic changes, and the consumption-led growth is forming. The consumption upgrading is in key period after China's average GDP exceeds 8,000 dollars. As in figure 4, the consumption contribution rate in 2003 decreased to 35.4 and then rose to 59.9 in 2015. Domestic consumption appears several characters, such as continuously increasing of consumption rate, accelerating of demand structure upgrading and enhancing stimulatory effect of consumption to economic growth. Consumption trend also changes from traditional basic necessities of life to green and healthy agricultural products, higher quality products and tourism, education, entertainment with better user experience. The corresponding supplying falls behind changes of consumption transformation and upgrading which causes the problem of exuberant consumption and insufficient supplying.

Figure 4 Contribution rate of final consumption to GDP growth

Therefore, many consumers choose cross-border consumption. Statistics show that Chinese tourists consumed about 1,200 billion RMB abroad in 2015. Total outbound tourists amounted to 1,200 billion, the scale of outbound tourism ranking the first in the world in three consecutive years. Among them, tourists to Germany, Italy and France increased 70%、41%、48% respectively compared with the previous year. The explosive increase far exceeded the annual growth rate, about 20%, in the previous five years. The consumption-led growth pattern creates broad space for enterprises to develop. The 2016<<White Paper of American Enterprises in China>> published by AmCham China states that 60% of member enterprises still consider China as the top three investment destinations. Most of member enterprises take innovation as their preferential

developed business. Over 90% of the visited enterprises believe that innovation in China will be an important driving force for their business growth in China.

1.2 New trend of EU-China industrial cooperation

Firstly, accompanied by a substantial increase in China's investment in the EU, the industrial investment between China and the EU changes from Europe to China, the one-way investment, to a two-way interactive investment (figure 5). The investment of Chinese enterprises in Europe has increased rapidly in recent years and the filed is also enlarged, including public infrastructures, manufacturing, telecommunication, finance, hotel and tourism, etc. China’s investment stock in the EU has reached 64.46 billion dollars by the end of 2015. Currently, China has established more than 2300 direct investment enterprises in the EU, covering all the EU members, 27 countries, and employing nearly 90 thousand foreign employees.

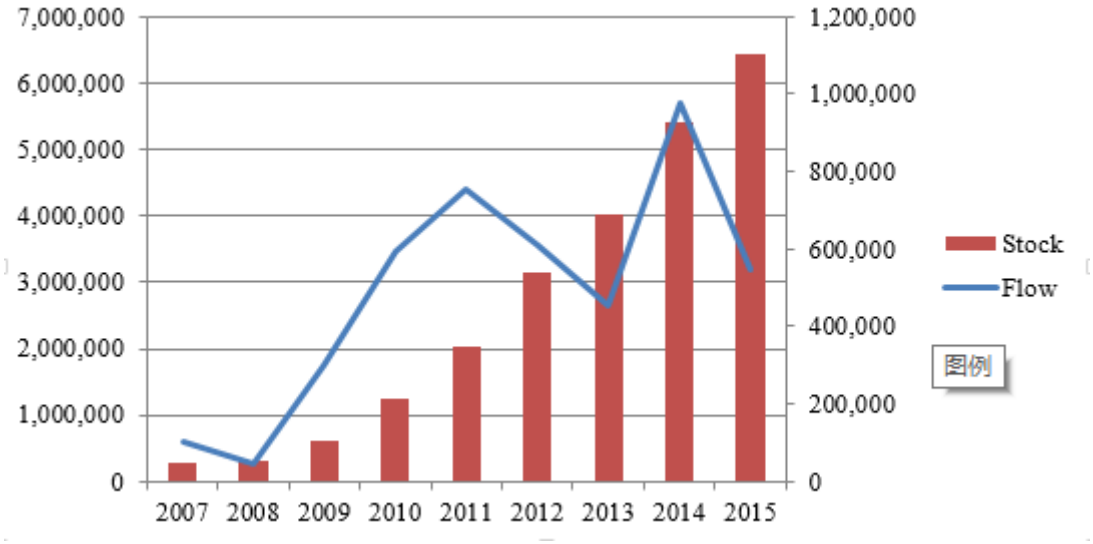


Figure 5 Chinese direct investment flow and stock to Europe during 2007-2015

Data source: <<Statistical bulletin of Chinese foreign direct investment in 2015>> published by the Ministry of Commerce

Secondly, the trend of complementary development along the industrial chain has formed initially. In the division of international industrial chain, Chinese manufacturing mainly produces low value-added and labor intensive products for a long time. The industrial sectors of main the EU member countries are mainly distributed in high-end manufacturing sector. There are 80% products are complementary in EU-China trade, and only 10% commodities have competitive relationship directly. For example, China exported 8.578 million tons of low-quality steel to the EU in 2015 and meanwhile imported 1.212 million tons of high-quality steel from the EU. China has comparative advantages in producing crude steel, but still needs to import high value-added steel from Europe. In terms of agricultural production, China is a very important trade market for the EU’s high-end agricultural products.

Thirdly, European investment in China pays more attention to serving the local market. Early the EU investment in China was mainly cost-driven type which took advantage of low labor cost, resources and environment in China, and products were sold all over the world. Since 2002, over 20% and 15% of processing trade have been exported to the United States and the EU respectively. As China's domestic market continues to expand, more and more foreign-capital enterprises in China choose Chinese market as their preferred operating target and scope of business.

Fourthly, the field of industrial cooperation between China and the EU expands continuously. At the beginning of reform and opening-up, manufacturing industry was the main concentration of the cooperation between China and the EU. Now, the cooperation scales expand to advanced agriculture and modern service industries. In 2015, trade volume of agricultural products between China and the EU was 21.47 billion dollars, increasing 9.9% compared with previous year; China imported 13.28 billion dollars of agricultural products from the EU, increasing 20.65% compared with previous year. China has signed about 70 agricultural cooperation agreements so far with the EU and its member countries, and more than ten joint agricultural committees or work teams have been established and operated. At present, trains from China to Europe has covered fifteen cities of ten European countries.

1.3 Technology innovation has been a new highlight in EU-China industrial cooperation

The EU is an important partner of China's international technology cooperation and the largest technology source for China. According to statistics, 30%-40% of Chinese technology comes from the EU, and a considerable part of high-end manufacturing technology also imports from the EU. Technology transfers from the EU to China are mainly achieved by European enterprises' investment in China. China is the largest demand side of European technology and equipment. In 2016, China Midea Group acquiring Germany Kuka attracted widespread attention. The acquisition is finally adopted, mainly because the shareholders of Kuka was persuaded by the huge market of industrial robot in China. It is predicted that after the deal, Kuka may over fulfill its goal of achieving 4-4.5 billion Euros revenue before 2020, among which one billion will come from Chinese market.

Chinese enterprises and scientific research institutes participate in patent activities in Europe more actively. According to research by Theon Van Dijk, the former chief economist of European Patent Office, patent applications submitted by Chinese to the European Patent Office have increased rapidly since 2000, and joint applications and joint inventions handled by the European Patent Office also have increased quickly (figure 6).

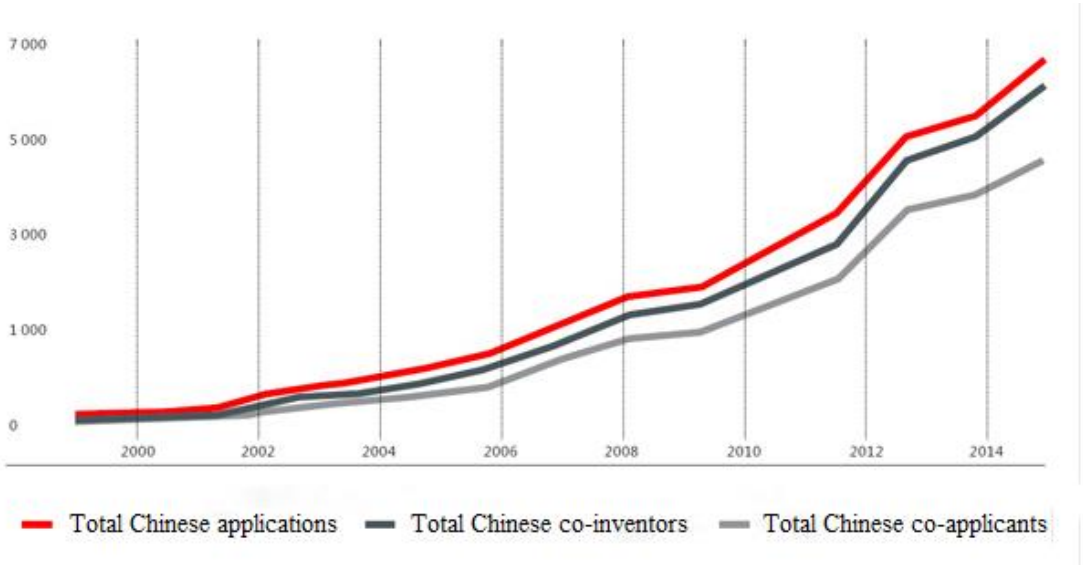


Figure 6 Chinese co-inventors or co-applicants in EPO applications[3]

During 2010-2014, there were 3,379 patent applications submitted by citizens of Contracting States to the European Patent Convention with at least one Chinese co-inventor. Although those applications only account for 0.9% of all patent applications filed by citizens of Contracting States over the same period, the growth rate is very fast. As shown in table 3, the top three fields of European Patent Convention applications using Chinese research and development achievements include: digital communication, organic fine chemistry and electrical machinery, equipment and energy.

Table 3 Patent applications rankings with at least one Chinese inventor included in all the submitted European Patent Office applications

Ranking	Country	Number of applications	Top three fields *		
1	Germany	906	Electrical machinery, equipment and energy	Other consumer goods	High polymer chemistry,polymer
2	France	664	Digital communication	Telecommunica -tion	Audio visual technology
3	Finland	446	Digital communication	Computer technology	Telecommunica -tion
4	Sweden	417	Digital communication	Telecommunica -tion	Food chemistry
5	Switzerland	344	Organic fine chemistry	Electrical machinery, equipment and energy	Food chemistry
6	Netherlands	221	High polymer chemistry,polymer	Organic fine chemistry	Electrical machinery, equipment and energy
7	UK	180	Organic fine chemistry	Furniture, games	Basic material chemistry
8	Denmark	79	Digital communication	Thermal treatment and equipment	Food chemistry
Total applications of European patent convention member countries : 3 379			Digital communication	Organic fine chemistry	Electrical machinery, equipment and energy

Statement: the ranking is based on total applications with at least one Chinese inventor included in

[3] Theon Van Dijk: <Research of China and the EU technology cooperation: evidence from European Patent data>. http://www.sipo.gov.cn/ztzl/hylt/zozlhzsszn/ssnzlhzhb/201511/t20151126_1208583.html

this technological field[4].

The EU-China technical cooperation field also expands gradually at present. In September, 2016, China, UK and France signed the final investment agreement of Hinkley point C nuclear power station. According to the agreement, Chinese consortium, led by China Guangdong Nuclear Power Company (CGNPO), and France Electricity Group (FEG) will invest and construct the Hinkley point C nuclear power station by using European Pressurised Reactor (EPR) technology. In the near future, the CGNPO will cooperate with FEG in Sizewell C and Bradwell B nuclear projects, and China's third-generation "Hualong No.1" with independent research and development will be adopted in Bradwell B project. The FEG has constructed several Chinese nuclear projects and has cooperated with CGNPO for over 30 years, and UK nuclear project is a successful example of cooperation among China, France and UK in advantage complementation, mutual benefit and multiple wins.

2. Existing Problems

2.1 External uncertainties in industrial cooperation have increased

At present, the Brexit, Trump's new policy, French, German and Italian elections have increased the uncertainty of EU-China industrial cooperation. Geopolitics, refugee crisis and terrorism have affected the prospects of China and the EU industrial cooperation. The new normal of China's economy needing to replace old developing impetuses with new driving forces also involves uncertain risks.

2.2 Trade protectionism resurfaces

Under the background of global economic downturn, trade protectionism increases significantly in many countries. In May, 2016, the European Parliament passed a non-legislative decision refusing to recognize the China's market economy status. One important reason is the fear of serious impact on European traditional industries. In terms of investment, the EU welcomes "green field" investment from China, but worries about cross-border mergers and acquisitions of Chinese enterprises, concerning about the loss of intellectual rights and safety issues.

2.3 Industrial frictions occur occasionally

Some of European and Chinese industries are over-produced which further causes the trade friction. In 2016, the EU committee took anti-dumping measures against Chinese steel products. Before European debt crisis, industrial disputes between China and the EU mainly focused on labor-intensive and low-end industries. With Chinese industrial upgrading and technology progress, the trade frictions between two parties extend to high-tech products, such as photovoltaic dispute during 2012-2013.

[4] same as above

2.4 Institutional protection of industrial investment needs to be strengthened

Although the mutual investment between China and the EU increases rapidly, there is still a lack of institutional protection. In November, 2013, EU-China investment agreement negotiations were officially launched, with the aim of achieving a higher level of agreement on investment protection and market admittance on the basis of the previous investment protection agreements between China and the EU member countries. 11 rounds of negotiations have been held so far and negotiations on important provisions such as investment protection, national treatment before entrance and negative lists are still under way.

2.5 Diversified interests of the EU industry increase the difficulty of coordination

The EU members are different in economic development levels and industrial structures, and 27 members have their own advantages separately in agriculture, manufacturing, service and even subdivided industries. Thus there are different voices and interests appealing in the process of deepening EU-China industrial cooperation, which brings difficulty for coordination.

2.6 Market environment needs optimization

Foreign enterprises investing in China reflect that Chinese market still has problems such as “lack of transparency, clarity or consistency in the legislative procedure”, and there are still some restrictions on market admittance. Intellectual property right enforcement has made progress, but some foreign enterprises still believe that China has higher risks in intellectual rights and data leakage.

3. Economic Effect Analysis of EU-China Industrial Cooperation

China and the EU are the most diverse economies in the world, and industrial cooperation is very complicated. On the one hand, 27 member countries of the EU have different factor endowments, different advantageous industries and diversified interests of industrial cooperation; on the other hand, industrial cooperation involves several industries and fields, and cooperation effect in different industries needs further observation. This paper adopts GTAP（Global Trade Analysis Project）model to analyze economic effect of EU-China industrial cooperation on GDP and overall welfare. Specifically, it’s to simulate different shock scenarios according to different degrees of industry barrier and the elimination of restrictions. Considering the Brexit, UK is not included in the analysis.

3.1 Model and data source

GTAP（Global Trade Analysis Project）is a global calculated general equilibrium model developed by Purdue University to analyze multiple regions and industries, and is usually used for effect assessment in advance of regional economic cooperation. This study uses the latest GTAP 9.0 database, which contains 140 countries and 57 industries, and the basic year is 2011. Countries are divided into China, 27 the EU member

countries and other countries according to object of study. According to the key industrial cooperation between China and the EU, industries are divided into ten groups, which are low-end manufacturing, high-end manufacturing, agriculture, agricultural products processing, textile, public utilities and construction, transportation, finance, commerce and trade service, health and education.

3.2 Scenario settings

This research will adopt a relatively static method to describe industrial cooperation degrees with intra-industry-trade technology expansion parameters. Three scenarios for parameters of intra-industry-trade technology barrier in key cooperation fields are set, namely 10%、20 and 50%, among which the higher value indicates higher degree of industrial cooperation. The simulation results focus on discussing the effect of EU-China industrial cooperation on their GDP and social welfare.

3.3 Result analysis

1. The industrial cooperation in low-end manufacturing, high-end manufacturing, agriculture, agricultural products processing, textile, public utilities and construction, transportation, finance, commerce and trade service, health and education industry, is helpful to improve GDP and welfare both in China and the EU.

2. With improvement of industrial cooperation, effects on GDP and welfare brought by the industrial cooperation in low-end manufacturing, high-end manufacturing, agriculture, agricultural products processing, textile, public utilities and construction, transportation, finance, commerce and trade service, health and education industry, also increase gradually.

3. In general, EU-China industrial cooperation barely influences other countries' GDP, but brings negative effect on welfare.

Table 4 Effect of industrial cooperation on GDP and overall welfare in three scenarios

Serial number	Industry	Country	10%		20%		50%	
			GDP（%）	Welfare (million dollars)	GDP（%）	Welfare (million dollars)	GDP（%）	Welfare (million dollars)
1	Low-end manufacturing	China	0.271	33611.941	0.542	67223.883	1.355	168059.719
		the EU	0.153	26490.07	0.305	52980.141	0.763	132450.359
		Other countries	-0.011	-21718.869	-0.022	-43437.738	-0.055	-108594.328
2	High-end manufacturing	China	0.163	16823.941	0.326	33647.883	0.815	84119.711
		the EU	0.073	10739.478	0.145	21478.955	0.363	53697.398
		Other countries	-0.002	-5279.505	-0.004	-10559.011	-0.011	-26397.521
3	Agricultural cooperation	China	0.007	603.447	0.013	1206.894	0.02	1810.341
		the EU	0.002	428.288	0.004	856.577	0.007	1284.865
		Other countries	0	-135.224	0	-270.448	0	-405.673
4	Agricultural products processing	China	0.008	789.477	0.017	1578.954	0.041	3947.386
		the EU	0.005	817.481	0.01	1634.961	0.026	4087.403
		Other countries	0	-223.282	0	-446.563	0	-1116.408
5	Textile	China	0.06	7652.365	0.12	15304.73	0.301	38261.82
		the EU	0.056	6882.988	0.111	13765.977	0.279	34414.945
		Other countries	-0.001	-1901.701	-0.002	-3803.402	-0.004	-9508.503

Serial number	Industry	Country	10%		20%		50%	
			GDP（%）	Welfare (million dollars)	GDP（%）	Welfare (million dollars)	GDP（%）	Welfare (million dollars)
6	Public utilities and construction	China	0.003	385.671	0.007	773.342	0.016	1933.356
		the EU	0.002	403.225	0.005	806.451	0.012	2016.127
		Other countries	0	-199.055	0	-398.109	0	-995.273
7	Transportation	China	0.032	3524.828	0.065	7049.657	0.162	17624.143
		the EU	0.022	3405.09	0.045	6810.18	0.112	17025.449
		Other countries	-0.001	-1282.442	-0.001	-2564.884	-0.002	-6412.207
8	Financial service	China	0.005	503.026	0.01	1006.052	0.024	2515.129
		the EU	0.002	408.846	0.005	817.692	0.011	2044.229
		Other countries	0	-231.97	0	-463.94	0	-1159.848
9	Commerce and trade service	China	0.016	1722.28	0.032	3444.561	0.081	8611.4
		the EU	0.01	1541.474	0.019	3082.949	0.048	7707.373
		Other countries	0	-672.083	0	-1344.166	-0.001	-3360.417
10	Health and education	China	0.001	155.189	0.002	310.378	0.006	775.946
		the EU	0.001	187.785	0.002	375.571	0.006	938.927
		Other countries	0	-66.114	0	-132.227	-0.001	-330.568

4. Suggestions

4.1 Focus on improving manufacturing cooperation

Strengthen cooperation of manufacturing development strategies such as “Made in China 2025”, Germany “Industry 4.0” and France “Future industry”. As China is an emerging power country while Europe is the headstream of industry revolution and has entered into post-industrial age, the complementarity of the cooperation between the two sides in manufacturing is greater than competition. In the global value chain of manufacturing, Germany and France and other countries rank in medium and high end, while China ranks in the bottom. The deepening of industrial cooperation between two parties is helpful to strengthen their respective strengths, make up for their respective disadvantages, and promote common development. The combination of China’s strong production capacity and Europe’s technology can help to enhance the competitiveness of both sides in the world. At the same time, the two sides work together to open up the third market, which contributes to a strong, balanced, inclusive and sustainable growth of the world economy.

4.2 Strengthen industrial policy coordination

Under the circumstance of global economy downturn, trade conflict caused by overcapacity is a global question. Whether to treat your partner with trade protectionism, or to work together and expand domestic demand and open up the third-party market, relates to the prospects of EU-China industrial cooperation. Thus, China and the EU should strengthen industrial policy coordination, and work together to handle the trade conflict caused by overcapacity. For example, the EU has abundant experience in international industrial coordination in steel, having the precedents for cooperation with the United States and Russian. In order to resolve excess capacity, the EU implemented “Davignon plan “ in 1977 and 1982, took relevant measures in enterprise production quotas, lowest price, import quantity and price and made great progress. China can learn from the EU’s experience and deal with capacity conflict between the two sides. In July, 2016, the establishment of China and the EU Joint Working Group on Export of Iron and Steel Production is a good beginning. The two parties can better understand the data of steel import and export between the two sides to confirm and monitor and then find solutions. In the future, the two sides can consider institutionalizing and normalizing the working group and extending to other industries, forming a EU-China industrial coordination mechanism.

4.3 Deepen modern agricultural cooperation

Agriculture has the important strategic meaning to the EU and China, and is closely bound to issues such as food safety, climate change and balanced development. Over the years, China and the EU have increased food and agricultural products trade on the basis of mutual trust, openness and cooperation. In the future, China and the EU should further strengthen communication and meeting, exchange agricultural information with each other, and carry out studies on complementarity of agricultural cooperation.

4.4 Expand industrial cooperation of ecological and environmental protection

The EU ranks the top in green energy, low-carbon technology and environmental management technology around the world, and is dominant in environmental protection industry. In contrast, China is in the process of industrialization and urbanization, and has great demand for energy-intensive products such as energy and building materials. Coal sources takes high percentage in energy and the percentage of renewable energy needs to be improved. China has the world's largest clean energy market with lower manufacturing cost, and needs the support of advanced technology and experience from the EU urgently. The two sides should strengthen ecological and environmental protection cooperation. China can consider taking more flexible policies about market admittance of the EU enterprises, attracting more the EU enterprises and advanced technology to enter China's environmental protection market.

4.5 Improve modern service industry cooperation

Fasten EU-China monetary and financial cooperation with RMB internationalization as the key point. Strengthen cooperation between Asian Infrastructure Investment Bank and European Bank for Reconstruction and Development, and carry out investment and financing cooperation between Asia and Europe. Strengthen construction of mechanisms in the mutual establishment of financial institutions and the connection of capital markets, creating a connected financial market between Asia and Europe. Promote the construction of international channels between Asia and Europe relying on "the Belt and Road Initiatives" strategy, optimize the formed international freight lines for Europe, Central Asia and other countries, which passed Manchuria, Erenhot, Xinjiang Alashankou and the border of Huoerguosi, and improve transportation efficiency between Asia and Europe. Optimize tourism lines and brand, and provide better experience for both tourists. With the cooperation of manufacturing plans "made in China 2025" and "industry 4.0", China should learn the advanced experience from Germany, France, etc., fasten the cooperation in vocational training and cultivate more qualified industrial workers.

4.6 Strengthen industry cooperation with focus on e-commerce

E-commerce has been a new trend of international trade, especially between medium and small-sized enterprises, whose demand for cross-border e-commerce is more urgent. EU-China should equally negotiate about the cross-border e-commerce, fully release development potential, and explore global and regional e-commerce regulations. At the same time, optimize the supervision of e-commerce express and other special items to improve the convenience of cross-border e-commerce clearance.

4.7 Deepen educational cooperation

Carry out multi-channel communications and all-around cooperation, promote joint training of talents and cooperation in running schools, develop courses jointly and innovate the training mode to create high-quality cooperative education institutions and projects. Strengthen communication in standards of personnel training, promote the

mutual recognition of credits both in higher education and vocational education, and gradually achieve the mutual awarding and joint granting of degrees. The two sides should make full use of dialogue mechanism of EU-China education policy, strengthen policy communication, identify cooperation orientations, communicate with and learn from each other in the experience on general education, higher education, vocational education, lifelong learning, preschool education and special education, etc., and construct a future-oriented China and the EU education community together.

4.8 Strengthen EU-China communication and cooperation in small and medium enterprises

Most of companies in the EU industrial production system are medium and small-sized enterprises, among which there are a huge amount of invisible champions. With the accelerating speed of China's transformation and upgrading, demand for new products and service is continuously emerging, and many European medium and small-sized enterprises can find their favorable positions. It's necessary to establish capital, information, project platforms for the cooperation between Chinese and European medium and small-sized enterprises to achieve win-win result. Strengthen the construction of EU-China industrial park to create opportunities for concentrated development of medium and small-sized enterprises in China and the EU.

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